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NOTES ON GEOGRAPHIC DISTRIBUTION

Update on the distribution of *Peropteryx leucoptera* Peters, 1867 (Mammalia, Chiroptera, Emballonuridae): First record for the state of Sergipe, northeastern Brazil

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ABSTRACT: Three female specimens of *Peropteryx leucoptera* were collected in the Refúgio da Vida Silvestre Mata do Junco, a fragment of Atlantic Forest located in the state of Sergipe, northeastern Brazil. These specimens represent the first record of the species for Sergipe, increasing to 44 the number of bat species recorded in this state. A summary of locality records for *P. leucoptera* indicates a disjunct distributional pattern for this species, with the majority of the records concentrated in the northern South America and a separate population in the Atlantic Forest of northeastern Brazil.

The doglike bats of the genus *Peropteryx* Peters, 1867 are small to medium-sized emballonurines (head and body 45–55 mm; forearm 38–54 mm), whose the distribution is restricted to the Neotropics (Lim *et al*. 2010; McDonough *et al*. 2011; Suarez-Castro *et al*. 2012). They can be further recognized by the following set of characters: dorsal pelage ranging from dark buffy brown to blackish brown; underparts paler than dorsum; wing sac small, located near the anterior border of the antebrachial membrane, and opening distally; wing membranes (plagiopatagium) attached to the leg at the distal end of the tibia; skull with expanded rostrum, distinct angle between rostrum and forehead, relatively short postorbital processes, and undivided basisphenoid pit (no median septum); and spicule-like anterior upper premolar (Jones and Hood 1993; Hood and Gardner 2008). These bats also present sexual dimorphism in size, with females being larger than males (Hood and Gardner 2008), and are insectivorous, feeding preferentially on small beetles and flies (Bradbury and Vehrencamp 1976; Reis and Peracchi 1987).

Currently, five species of *Peropteryx* are recognized (Lim *et al.* 2010): *P. kappleri* Peters, 1867; *P. leucoptera* Peters, 1867; *P. macrotis* (Wagner, 1843), *P. trinitatis* Miller, 1899, and *P. pallidoptera* (Lim, Engstrom, Reid, Simmons, Voss & Fleck, 2010). All these species occur in Brazil (Peracchi *et al*. 2011; Castro *et al*. 2012). *Peropteryx leucoptera* was originally described from a specimen collected in Suriname. Subsequently, this species was classified in its own subgenus *Peronymus* (Peters, 1868), which was later recognized as a genus (Miller 1907; Sanborn 1937; Corbet and Hill 1991). However, recent evidence shows that this taxon forms a monophyletic group with other *Peropteryx* (Lim *et al*. 2008), which supports the recognition of *Peronymus* as a junior synonym (Jones and Hood 1993; Simmons 2005; Hood and Gardner 2008; Lim *et al*. 2010). *Peropteryx leucoptera* is found in French Guiana, Guyana, Suriname, Venezuela, Colombia, Peru, Brazil, and Ecuador (Hood and Gardner 2008; Lim *et al.* 2010; McDonough *et al.* 2010). In Brazil, this species occurs in the Amazon and Atlantic Forest biomes (Paglia *et al.* 2012), but few records are available, all from the states of Amazonas (Reis and Peracchi 1987; Sampaio *et al.* 2003), Pará (Vieira 1942, 1955; Bernard 1999; Bernard *et al.* 2001; Bernard and Fenton 2002; Marques-Aguiar *et al.* 2002), Pernambuco (Guerra 1980; Silva and Guerra 2000), and Paraíba (Feijó and Langguth 2011).

During a bat survey at the Refúgio da Vida Silvestre Mata do Junco (RVS-Mata do Junco) (10°32′ S, 37°03′ W), a 894 ha state reserve located in the municipality of Capela, state of Sergipe, northeastern Brazil (Figure 1), three adult *P. leucoptera* were collected (license number: 2009.05.0603/00105-03). These bats were caught during the day, in their shelter, using hand nets. Mata do Junco is an area of open rainforest, with numerous tree fall gaps and surrounded by an anthropogenic matrix that includes sugar cane (*Saccharum* spp.) plantations.

The specimens of *P. leucoptera* are preserved in 70° alcohol, with skulls removed, and were deposited in the Adriano Lúcio Peracchi Collection, at the Instituto de Biologia of the Universidade Federal Rural do Rio de Janeiro, under the numbers ALP 9730, 9731, and 9732. The specimens were identified according to the descriptions of Hood and Gardner (2008) and Lim *et al.* (2010). External and cranial measurements were obtained using callipers (0.02 mm precision) following the criteria described by Taddei *et al.* (1998).

The specimens examined present measurements within or very close to the variation reported for *P. leucoptera* (Table 1) and have translucent white dactylopatagium, but dark brown propatagium and plagiopatagium. Their ears are connected by a low band of skin across the forehead, and pterygoid pits are large and deep (Figure 2). This

Table 1. Selected measurements of *Peropteryx leucoptera* from Refúgio da Vida Silvestre Mata do Junco, Sergipe, northeastern Brazil[1], French Guiana[2], Ecuador[3], and Colombia[4].

	Present study [1]			Lim *et al.* (2010)[2]	McDonough *et al.* (2011)[3]	Suaréz-Castro *et al.* (2012)[4]
Sex	**Females**			**Males**	**Females**	**Males**
Variables	**ALP 9730**	**ALP 9731**	**ALP 9732**			
Weight	8.40	8.20	9.00	4.00 – 8.50	5.50 – 8.50	–
Tail length	13.41	14.41	14.80	5.00 – 17.00	12.00 – 17.00	11.00 – 17.00
Hind foot length	7.52	6.70	8.48	7.00 – 10.00	7.00 – 10.00	7.00 – 9.00
Ear length	17.59	14.49	14.25	13.00 – 20.00	15.00 – 18.50	13.00 – 18.00
Forearm length	42.88	43.50	44.10	41.00 – 46.00	42.00 – 45.00	39.90 – 44.30
Greatest skull length	15.70	15.46	15.74	14.90 – 15.16	15.80	15.10 – 16.10
Condyloincisive length	14.88	14.20	14.72	13.90 – 14.10	14.80	13.80 – 14.70
Upper toothrow length	6.24	6.42	6.36	6.10 – 6.20	6.50	6.30 – 6.60
Breadth across upper canines	4.28	4.26	4.18	–	–	–
Postorbital breadth	3.26	3.62	3.28	3.10 – 3.30	3.40	3.30 – 3.60
Breadth across upper molars	7.24	7.12	7.24	6.70 – 7.00	7.40	6.90 – 7.50
Braincase breadth	7.30	7.46	7.32	7.00 – 7.30	7.10	6.80 – 7.40
Zygomatic breadth	9.92	9.98	9.52	9.30 – 9.60	10.20	9.50 – 10.10
Mastoid breadth	8.14	8.06	8.18	7.60 – 8.00	7.90	7.70 – 8.00
Mandible length	11.26	11.14	11.24	–	–	–
Lower toothrow length	6.56	6.40	6.56	–	–	–

[2]N = 14 males and 7 females (external measurements); 4 males (cranial measurements)

[3]N = 9 females (external measurements); 1 female (cranial measurements)

[4]N = 3 males and 2 females (external measurements); 2 males and 1 female (cranial measurements)

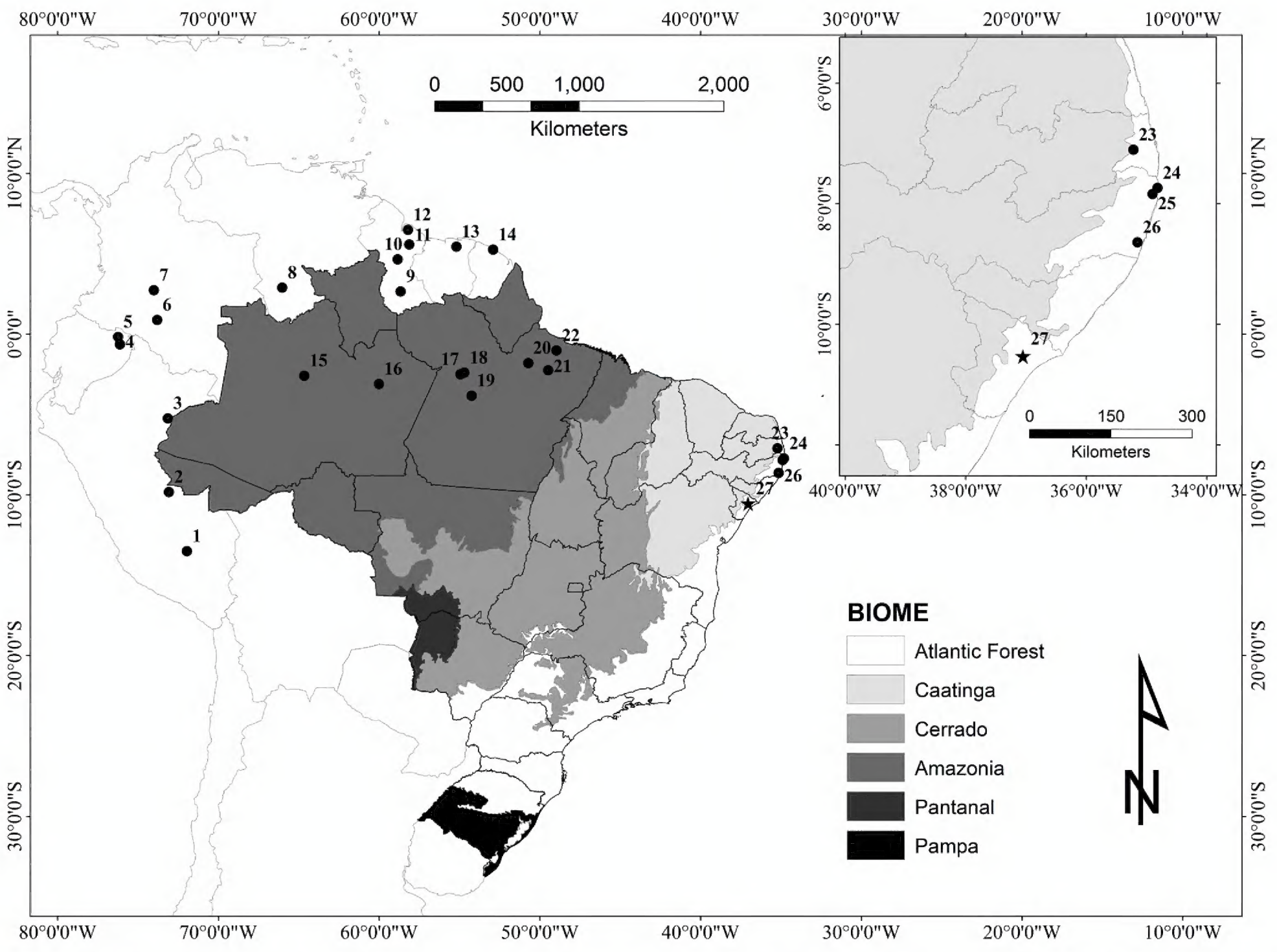

Figure 1. Geographic distribution of *Peropteryx leucoptera* and the new records (star) in the Refúgio da Vida Silvestre Mata do Junco, in the state of Sergipe, northeastern Brazil. For numbers of localities, see Table 2.

combination of morphological characters is diagnostic for *P. leucoptera* (Hood and Gardner 2008; Lim *et al.* 2010). The recently described *P. pallidoptera*, recorded in Brazil based on a female collected in the state of Pará (Castro *et al.* 2012), also has pale or white wings beyond the forearm. However, in *P. pallidoptera* the propatagium and plagiopatagium are also translucent. Furthermore, this species has ears separated on the forehead and a skull with shallow pterygoid pits separated by a mesopterygoid extension and positioned anterolaterally to the basisphenoid pit (Lim *et al.* 2010).

Peropteryx leucoptera inhabits mainly primary and secondary rainforests (Simmons and Voss 1998; McDonough *et al.* 2011), but can also be found in dry open formations adjacent to riparian forests, agricultural areas, and pastures (Suaréz-Castro *et al.* 2012). Most available records were assigned based on individuals captured in roosts (*e.g.*, hollow trees, cavities, under tree roots on the banks of rivers, under fallen tree trunks, dark spaces under tree leaves), although ground-level mist-nets have also been useful for capturing this species (Brosset and Charles-Dominique 1990; Simmons and Voss 1998; McDonough *et al.* 2011). Our specimens, three lactating females, two of which carrying young, were all collected inside a hollow tree (*Eschweilera* sp). This reinforces the importance of sampling bat refuges, especially considering that emballonurids are difficult to be captured in mist-nets set in the understory (Simmons and Voss 1998).

The locality records available for *P. leucoptera* (Table 2 and Figure 1) indicate a disjunct pattern of geographic distribution for this species, with populations located in the northern South America and in the Atlantic Forest of northeastern Brazil. These populations seem to be morphologically similar, based on the mensural data analyzed here, but larger samples and diverse data sets should be considered in further taxonomic assessments.

The specimens collected here represent the first record of *P. leucoptera* for the state of Sergipe, where 43 species of bats have been recorded **(**Mikalauskas 2005; Feijó and Nunes 2010; Rocha *et al.*, 2010, 2011a, 2011b; Mikalauskas *et al.* 2011; Brito and Bocchiglieri 2012; Leal *et al.* 2013). This record indicates the need for further sampling efforts in this region, in order to obtain a better understanding of the diversity, distribution patterns, and natural history of the bats, as well as their functional roles in the local ecosystems.

Figure 2. Live view of an adult female *P. leucoptera* collected at Refúgio da Vida Silvestre Mata do Junco, municipality of Capela, state of Sergipe, northeastern Brazil (A) (Photo by P. A. da Rocha), with details of the glandular pouch on propatagium (B) and white transparent wing membranes (C).

Table 2. Locality records for *Peropteryx leucoptera* in Brazil and in other South American countries. The code numbers refer to the points shown in Figure 1.

COUNTRY/ POINT	COORDINATES		LOCALITY	REFERENCE
PERU				
1	13°30′ S	71°58′ W	Madre de Dios- Cusco	Solari *et al.* (2006)
2	9°49′ S	73°5′ W	Ucayali, Tushemo(type locality of Peronymus cyclops O. Thomas)	Thomas (1924)
3	5°14′ S	73°9′ W	Loreto- Nuevo San Juan	Lim *et al.* (2010)
ECUADOR				
4	0°38′ S	76°8′ W	Orellana -Province Tiputini Biodiversity Station	Rex *et al.* (2008)
5	0°10′ S	76°15′ W	Suriname	McDonough *et al.* (2011)
COLOMBIA				
6	0°54′ N	73°49′ W	Caquetá	Marin-Vasquez and Aguilar-González (2005)
7	2°45′ N	74°1′ W	Meta - Campamento Chamusa	Lemke *et al.* (1982)
VENEZUELA				
8	2°54′ N	66°2′ W	Rio Casiquiare	GBIF - coletados por Olalla AMNH 78419
GUYANA				
9	2°40′ N	58°40′ W	Upper Essequibo-Upper Takutu	Lim *et al.* (2010)
10	4°40′ N	58°51′ W	Potaro-Siparuni- Iwokrama Forest Field Station	Lim *et al.* (2010); Lim and Engstrom (2001)
11	5°35′ N	58°8′ W	Upper Demerara-Berbice-Bada Creek	Lim *et al.* (1999)
12	6°30′ N	58°13′ W	Demerara-Mahaica-Ceiba Biological Center	Lim *et al.* (2010)
SURINAM				
13	5°27′ N	55°12′ W	Zanderij	Genoways *et al.* (1981)
FRENCH GUIANA				
14	5°16′ N	52°55′ W	Paracou	Simmons and Voss (1998)
BRAZIL				
15	2°35′ S	64°40′ W	Reserva de Desenvolvimento Sustentável Amanã-AM	Ramos *et al.* (2010)
16	3°6′ S	60°1′ W	Manaus-AM	Reis (1984); Sampaio *et al.* (2003); Bernard *et al.* (2001)
17	2°30′ S	54°57′ W	Alter do Chão-PA	Bernard and Fenton (2002); Bernard (1999)
18	2°24′ S	54°42′ W	Santarém-PA	Bernard *et al.* (2001)
19	3°50′ S	54°15′ W	Parque Nacional da Amazônia-PA	Reis and Schubart (1979)
20	1°48′ S	50°43′ W	Estação Científica Ferreira Penna- município de Melgaço- PA	Marques-Aguiar *et al.* (2003)
21	2°15′ S	49°9′ W	Cometá-PA	Sanborn (1937)
22	1°1′ S	48°58′ W	Cachoeira, Ilha de Marajó-PA	Vieira (1942); Vieira (1955)
23	7°6′ S	35°13′ W	Sapé-PB	Feijó and Langguth (2011)
24	7°44′ S	34°49′ W	Itamaracá-PE	Monteiro da Cruz *et al.* (2002)
25	7°50′ S	34°54′ W	Refúgio Ecológico Charles Darwin / Iguarassu-PE	Silva and Guerra (2000)
26	8°38′ S	35°9′ W	Estação Experimental de Saltinho-Rio Formoso-PE	Guerra (1980)
27	10°32′ S	37°3′ W	RVS Mata do Junco- Capela	This study

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Literature Cited

Bernard, E. 1999. Notes on a colony of *Peropteryx leucoptera* (Emballonuridae) in Brazil. *Bat Research News* 40(2): 37–38.

Bernard, E., A.L.K.M. Albernaz and W.E. Magnusson. 2001. Bat species composition in three localities in the Amazon basin. *Studies on Neotropical Fauna and Environment* 36(11): 177–184.

Bernard, E. and M.B. Fenton. 2002. Species diversity of bats (Chiroptera: Mammalia) in forest fragments, primary forests and savannas in Central Amazonia, Brazil. *Canadian Journal of Zoology* 80(9): 1124–1140.

Bradbury, J.W. and S.L. Vehrencamp. 1976. Social organization and foraging in emballonurid bats. I. Field studies. *Behavioral Ecology and Sociobiology* 1: 337–381.

Brito, D.V. and A. Bocchiglieri. 2012. Comunidade de morcegos (Mammalia, Chiroptera) no Refúgio de Vida Silvestre Mata do Junco, Sergipe, nordeste do Brasil. *Biota Neotropica* 12(3): 1–8.

Brosset, A. and P. Charles-Dominique. 1990. The bats from French Guiana: a taxonomic, faunistic and ecological approach. *Mammalia* 54(4): 509–560.

Castro, I.J., E.R. Santos, A.C.M. Martins, D. Dias and A.L. Peracchi. 2012. First record of the pale winged dog like bat *Peropteryx pallidoptera* (Chiroptera: Emballonuridae) for Brazil. *Mammalia* 76(4): 451–453.

Corbet, G.B. and J.E. Hill. 1991. *A world list of mammalian species*. Third edition. London: Natural History Museum Publications and Oxford University Press, 243 pp.

Feijó, J.A. and H.L. Nunes. 2010. Mammalia, Chiroptera, Phyllostomidae, *Artibeus planirostris* (Spix, 1823) and *Trachops cirrhosus* (Spix, 1823): First record for the state of Sergipe, northeastern Brazil. *Check List* 6(1): 15–16.

Feijó, J.A. and A. Langguth. 2011. Lista de Quirópteros da Paraíba, Brasil com 25 novos registros. *Chiroptera Neotropical* 17(2): 1055–1062.

GBIF Annual Report. 2012. Global Biodiversity Information Facility. Accessible at http:// www.gbif.org/orc/doc_id=5304 Captured on 05 January 2013.

Genoways, H.H., S.L. Williams and J.A. Groen. 1981. Results of the Alcoa Foundation-Suriname Expeditions. V. Noteworthy records of Surinamese mammals. *Annals of the Carnegie Museum* 50: 319–32.

Guerra, D.Q. 1980. *Peropteryx* (*Peronymus*) *leucopterus* Peters, 1867 no

nordeste do Brasil (Chiroptera – Emballonuridae). *Revista Nordestina de Biologia* 3: 137–139.

Hood, C. and A.L. Gardner. 2008. Family Emballonuridae Gervais, 1856; pp. 188–207, in: A.L. Gardner (ed.). *Mammals of South America. Volume I: Marsupials, Xenarthrans, Shrews, and Bats.* Chicago: The University of Chicago Press.

Jones Jr., J.K. and C.S. Hood. 1993. Synopsis of South American bats of the family Emballonuridae. *Occasional Papers, The Museum, Texas Tech University* 155: 1–32.

Leal, E.S.B., S.M. Azevêdo Jr., F.V.P. Vila Nova, D.Q. Guerra and W.R. Telino-Jr. 2013. Updated compilation of bat species (Chiroptera) for the Brazilian state of Sergipe, including new records. *Chiroptera Neotropical* 19(1): 1163–1178.

Lemke, T.O., A. Cadena, R.H. Pine and J. Hernández-Camacho. 1982. Notes on opossums, bats, and rodents new to the fauna of Colombia. *Mammalia* 46: 225–34.

Lim, B.K., M.D. Engstrom, R.M. Timm, R.P. Anderson and L.C. Watson. 1999. First records of 10 bat species in Guyana and comments on diversity of bats in Iwokrama Forest. *Acta Chiropterologica* 1: 179–190.

Lim, B.K., M.D. Engstrom. 2001. Species diversity of bats (Mammalia: Chiroptera) in Iwokrama Forest, Guyana, and the Guianan subregion: implications for conservation. *Biodiversity and Conservation* 10: 613–657.

Lim, B.K., M.D. Engstrom, J.W. Bickham and J.C. Patton. 2008. Molecular phylogeny of New World sheath-tailed bats (Emballonuridae: Diclidurini) based on loci from the four genetic transmission systems in mammals. *Biological Journal of the Linnean Society* 93: 189–209.

Lim, B.K., M.D. Engstrom, F.A. Reid, N.B. Simmons, R.S. Voss and D.W. Fleck. 2010. New Species of *Peropteryx* (Chiroptera: Emballonuridae) from Western Amazonia with Comments on Phylogenetic Relationships within the Genus. *American Museum Novitates* 3686: 1–20.

Marin-Vasquez A. and A.V. Aguilar-González. 2005. Murciélagos del departamento de Caquetá-Colombia. *Biota Colombiana* 6: 211–218.

Marques-Aguiar, S.A., C.C.S. Melo, G.F.S. Aguiar and J.A.L. Queiróz. 2002. Levantamento preliminar da mastofauna da região de Anajás-Muaná, Ilha de Marajó, Pará, Brasil. *Revista Brasileira de Zoologia* 19(3): 841–854.

Marques-Aguiar, S.A., M.V. Aguila, G.F.S. Aguiar, N. Saldanha, J. Silva-Junior and M.M.B. Rocha. 2003. Caracterização e perspectivas de estudo dos quirópteros da Estação Científica Ferreira Penna- município de Melgaço-PA. *Ideias e Debates* 6: 1–3.

McDonough, M.M., B.K. Lim, A.W. Ferguson, C.M. Brown, S.F. Burneo and A.K. Loren. 2011. Mammalia, Chiroptera, Emballonuridae, *Peropteryx leucoptera* Peters, 1867 and *Peropteryx pallidoptera* Lim, Engstrom, Reid, Simmons, Voss, and Fleck, 2010: distributional range extensions in Ecuador. *Check List* 6(4): 639–643.

Mikalauskas, J.S. 2005. Morcegos; pp. 93–103, in: C.M. Carvalho and J.C. Vilar (ed.). *Parque Nacional Serra de Itabaiana - Levantamento da Biota*. Aracaju: IBAMA, UFS. *Biologia Geral e Experimental.*

Mikalauskas, J.S., P.A. Rocha, D. Dias and A.L. Peracchi. 2011. Mammalia, Chiroptera, Vespertilionidae *Rhogeessa hussoni* Genoways & Baker, 1996: first record for the state of Sergipe, Northeastern Brazil. *Check List* 7(6): 883–885.

Miller, G.S. 1907. The families and genera of bats. *United States National Museum Bulletin* 57: 1–282.

Monteiro da Cruz, M.A.O., M.C.C. Cabral, L.A.M. Silva and M.L.C.B. Campelo. 2002. Diversidade da Mastofauna no Estado de Pernambuco; pp. 557–559 *In* M. Tabarelli and J.M.C. Silva (ed.). *Diagnostico da Biodiversidade de Pernambuco.* Volume 2. Recife: Secretaria de Ciências, Tecnologia e Meio Ambiente.

Paglia, A.P., G.A.B. da Fonseca, A.B. Rylands, G. Herrmann, L.M.S. Aguiar, A.G. Chiarello, Y.L.R. Leite, L.P Costa, S. Siciliano, M.C.M. Kierulff, S.L. Mendes, V. C. Tavares, R.A. Mittermeier and J.L. Patton. 2012. Lista anotada dos mamíferos do Brasil / Annotated checklist of Brazilian mammals. 2nd Edition. *Occasional Papers in Conservation Biology*, No. 6. Arlington: Conservation International.

Peracchi, A.L., I.P. Lima, N.R. Reis, M.R. Nogueira and H. Ortêncio Filho. 2011. Ordem Chiroptera; pp. 155–234, in: N.R. Reis, A.L. Peracchi, W.A. Pedro and I.P. Lima (ed.). Mamíferos do Brasil, 2ª ed. Londrina: Editora da Universidade Estadual de Londrina.

Ramos P.M.J., J.T. Marques and J.M. Palmeirim. 2010. Vertical stratification of bat assemblages in flooded and unflooded Amazonian forests. *Current Zoology* 56(4): 469–478.

Reis, N.R. 1984. Estrutura de comunidade de morcegos na região de Manaus, Amazonas. *Revista Brasileira de Biologia* 44: 247–54.

Reis, N.R. and A.L. Peracchi. 1987. Quirópteros da região de Manaus, Amazonas, Brasil (Mammalia, Chiroptera). *Boletim do Museu Paraense Emílio Goeldi, Série Zoologia* 39(20): 161–182.

Reis, N.R. and H.O.R. Schubart. 1979. Notas preliminares sobre os morcegos do Parque Nacional da Amazônia (Médio Tapajós). *Acta Amazônica* 9: 507–515.

Rex, K., D.H. Kelm, K. Wiesner, T.H. Kunz and C.C. Voigt. 2008. Species richness and structure of three Neotropical bat assemblages. *Biological. Journal of the Linnean Society* 94: 617–629.

Rocha, P.A., J.S. Mikalauskas, S.F. Gouveia, V.V.B. Silveira, and A.L. Peracchi. 2010. Morcegos (Mammalia, Chiroptera) capturados no Campus da Universidade Federal de Sergipe, com oito novos registros para o estado. *Biota Neotropica* 10(3): 183–188.

Rocha P.A., J.A. Feijó, J.S. Mikalauskas and S.F. Ferrari. 2011a. First records of mormoopid bats (Chiroptera, Mormoopidae) from the Brazilian Atlantic Forest. *Mammalia* 75(3): 295–299.

Rocha, P.A., J.A. Feijó, J. Ruiz-Esparza and S.F. Ferrari. 2011b. *Uroderma magnirostrum* Davis, 1968 (Chiroptera, Phyllostomidae): First record from the state of Sergipe, Northeastern Brazil. *Check List* 7(6): 886–888.

Sampaio, E.S., E.K.V. Kalko, E. Bernard, B. Rodriguez-Herrera and C.O. Handley, Jr. 2003. A biodiversity assessment of bats (Chiroptera) in a tropical lowland rainforest of Central Amazonia, including methodological and conservation considerations. *Studies on Neotropical Fauna and Environment* 38(1): 17–31.

Sanborn, C.C. 1937. American bats of the subfamily Emballonurinae. *Field Museum of Natural History, Zoological Series* 24: 321–354.

Silva, L.A.M. and D.Q. Guerra. 2000. Bats from a remnant of Atlantic forest in northeast Brazil. *Chiroptera Neotropical* 6(1-2): 125–126.

Simmons, N.B. 2005. Order Chiroptera; p. 312-529 *In* D.E. Wilson and D.M. Reeder (ed.). *Mammal species of the world: a taxonomic and geografic reference*. 3rd Edition. Baltimore: Johns Hopkins University Press.

Simmons, N.B. and R.S. Voss. 1998. The mammals of Paracou, French Guiana: a neotropical lowland rainforest fauna. Part I. Bats. *Bulletin of the American Museum of Natural History* 273: 1–219.

Solari, S.V., V. Pacheco, L. Luma, P.M. Velazco and B.D. Patterson. 2006. Mammals of the Manu Biosphere; pp. 13–23, in: B.D. Patterson, D.F. Stotz and S. Solari (ed.). *Mammals and Birds of the Manu Biosphere Reserve, Peru.* Fieldiana, Zoology, n. s., N° 10.

Suaréz-Castro, A.F., H.E. Ramirez-Chaves, M.E. Rodriguez-Posada and J. Garcia. 2012. New records of *Peropteryx leucoptera* and first record of *Peropteryx pallidoptera* (Chiroptera-Emballonuridae) from Colombia. *Mastozoología Neotropical* 19(1): 165–171.

Taddei, V.A., C.A. Nobile and E. Morielle-Versute. 1998. Distribuição geográfica e análise morfométrica comparativa em *Artibeus obscurus* (Schinz, 1821) e *Artibeus fimbriatus* Gray, 1838 (Mammalia, Chiroptera, Phyllostomidae). *Ensaios e Ciência* 2(2): 71–127.

Thomas, O. 1924. On a collection of mammals made by Mr. Lathan Rutter in the Peruvian Amazonas. *Annals and Magazine of Natural History* 9(13): 530–538.

Vieira, C.O.C. 1942. Ensaio Monográfico sobre os Quirópteros do Brasil. *Arquivos de Zoologia* 3: 219–471.

Vieira, C.O.C. 1955. Lista remissiva dos mamíferos do Brasil. *Arquivos de Zoologia do Estado de São Paulo* 8: 341–474.

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